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MAGNETOSTRATIGRAPHIC AND GEOCHRONOLOGIC CALIBRATION OF NEOGENE --ETC(U)

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The gross paleomagnetic polarity sequence recorded in deep-sea sediments has now been clarified as far back in time as Late Oligocene using chronologically overlapping cores from the tropical Pacific. This research also provided the foundation for various authors to propose a Neogene paleomagnetic "time-scale". Although this scale is still evolving, at least in part it corresponds well with similar scales based on marine magnetic anomilies and radiomagnetic dates from continental sections. (cont on p 1473 B) (continued)

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20. Abstract (continued) ef p 1473 b)

It is possible to directly calibrate planktonic microfossil datum plates against the magnetic sequence in the sediments, and hence, against the proposed time scale. ~~Here we~~ present a first attempt to compile a comprehensible catalogue of such calibrations for stratigraphically important Neogene radiolarian datum planes. In a few instances, due to inadequate representation of particular species in some cores, either the top (T) or bottom (B) of a range could not be determined.

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1473 B

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MAGNETOSTRATIGRAPHIC AND GEOCHRONOLOGIC CALIBRATION OF NEOGENE RADIOLARIAN EVENTS, TROPICAL PACIFIC

The gross paleomagnetic polarity sequence recorded in deep-sea sediments has now been clarified as far back in time as Late Oligocene using chronologically overlapping cores from the tropical Pacific. This research also provided the foundation for various authors to propose a Neogene paleomagnetic "time scale." Although this scale is still evolving, at least in part it correlates well with similar scales based on marine magnetic anomalies and radiometric dates from continental sections. Magnetostratigraphic research in Iceland, in Mediterranean Neogene stratotypic sections, and on selected Deep Sea Drilling Project sites of the tropical Pacific, is further corroborating and adding details to this evolving time scale.

One of the first benefits drawn from the above magnetostratigraphic work is the possibility of directly calibrating planktonic microfossil datum planes against the magnetic sequence in the sediments, and hence, against the proposed time scale. Here we present (Table 1) a first attempt to compile a comprehensive catalogue of such calibrations for stratigraphically important Neogene radiolarian datum planes. All listed events were observed in the deep-sea cores studied in our earlier papers (Theyer and Hammond, 1974a, 1974b). In a few instances, due to inadequate representation of particular species in some cores, either the top (T) or bottom (B) of a range could not be determined. Users of this data should realize that, in general, a

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B-datum plane is of greater stratigraphic reliability than a T-datum, and that the sequence of specific events obviously depends, to a degree, on the investigator's taxonomic concepts.

Table 1. Paleomagnetic and geochronologic calibration of Neogene radiolarian events observed in the piston cores studied by Theyer and Hammond (1974a, 1974b). The listing is from youngest to oldest; however, when two or more events are concurrent, alphabetical order was used.

	Species	Events*	Paleomagnetic Calibration	Age (my)
	PLIOCENE (-1.8 to -5 my)			
1	Pterocanium prismatium	T	early 1/3 of Matuyama	1.6
2	Stichocorys peregrina	T	latest Gauss	2.5
3	Spongaster pentas	T	latest Gilbert	3.4
4	Ommatartus penultimus	T	middle Gilbert	3.6
5	Spongaster tetras	B	middle Gilbert	3.6
6	Ommatartus tetrathalamus	B	middle Gilbert	3.8
7	P. prismatium	B	early 1/3 of Gilbert	4.4
8	Solenosphaera omnituba	T	early 1/4 of Gilbert	4.7
9	S. pentas	B	bottom of Gilbert	4.8
10	Acrobotrys tritubus	T	earliest Gilbert	4.9
	LATE MIOCENE (-5 to -10.7 my)			
11	Ommatartus antepenultimus	T	middle of Epoch 5	5.5
12	Stichocorys delmontensis	T	latest Epoch 6	6.0
13	Stichocorys peregrina	B	early 1/4 of Epoch 6	6.3
14	A. tritubus	B	early 1/4 of Epoch 6	6.4
15	S. omnituba	B	early 1/4 of Epoch 6	6.4
16	Ommatartus hughesi	T	latest Epoch 9	8.8
17	O. penultimus	B	latest Epoch 9	8.8
18	Cannartus laticonus	T	early 1/3 of Epoch 9	9.5
19	Cannartus petterssoni	T	early 1/3 of Epoch 9	9.5
20	O. antepenultimus	B	latest Epoch 11	10.7
21	O. hughesi	B	latest Epoch 11	10.7
	MIDDLE MIOCENE (-10.7 to -15 my)			
22	Stichocorys wolffii	T	top of Epoch 11	10.8
23	Cyrtocapsella cornuta	T	middle of Epoch 11	11.1
24	Dorcadospyris alata	T	middle of Epoch 11	11.1
25	C. petterssoni	B	early 1/3 of Epoch 11	11.2

	Species	Events*	Paleomagnetic Calibration	Age (my)
26	Acrocubus octopylus	T	earliest Epoch 11	11.4
27	Cyrtocapsella tetrapera	T	earliest Epoch 11	11.4
28	Tympanidium binoctonum	T	earliest Epoch 11	11.4
29	Giraffospyris toxaria	T	latest Epoch 12	11.5
30	Calocycletta costata	T	top of Epoch 12	11.6
31	Calocycletta virginis	T	top of Epoch 12	11.6
32	Cyclampterium leptetrum	T	middle of Epoch 12	11.7
33	Cannartus laticonus	B	latest Epoch 15	13.4
34	Lithopera neotera	B	middle Epoch 15	14.1
35	Cannartus violina	T	early 1/3 Epoch 15	14.2
	EARLY MIOCENE (-15 to -23.5 my)			
36	Dorcadospyris dentata	T	top of Epoch 16	15.2
37	Dorcadospyris forcipata	T	top of Epoch 16	15.2
38	D. alata	B	middle of Epoch 16	15.5
39	Liriospyris parkerae	B	middle of Epoch 16	16.0
40	Cannartus prismaticus	T	middle of Epoch 16	16.6
41	G. toxaria	B	early Epoch 16	16.9
42	A. octopylus	B	early Epoch 16	16.9
43	Lychnocanoma elongata	T	bottom Epoch 16	17.2
44	Cannartus mammiferus	B	bottom Epoch 16	17.5
45	C. costata	B	Epoch 17/18 boundary	18.6
46	D. dentata	B	latest 1/3 of Epocn 18	18.8
47	S. wolffii	B	middle Epoch 18	19.2
48	Dorcadospyris praeforcipata	T	earliest Epoch 18	19.4
49	Liriospyris stauropora	B	Epoch 18/19 boundary	19.5
50	Dorcadospyris simplex	T	late Epoch 19	19.6
51	Cyclampterium pegetrum	T	middle Epoch 19	20.0
52	Dorcadospyris ateuchus	T	middle Epoch 19	20.0
53	Cannartus tubarius	T	?early Epoch 19	?20.7
54	C. violina	B	early Epoch 19	20.7
55	S. delmontensis	B	latest Epoch 20	20.9
56	Calocycletta serrata	T	late Epoch 20	21.1
57	Atrophormis gracilis	T	middle Epoch 20	21.6
58	C. leptetrum	B	middle Epoch 20	21.6
59	Dorcadospyris papilio	T	middle Epoch 20	21.6
60	Calocycletta robusta	T	middle Epoch 20	21.7
61	C. tetrapera	B	latest Epoch 21	22.4
62	C. cornuta	B	late Epoch 21	22.5
63	C. virginis	B	late Epoch 21	22.5
64	Theocyrtis annosa	T	late Epoch 21	22.7
65	C. serrata	B	late Epoch 21	23.2

*T = top, B = bottom of range.

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